REMARKS

The present application includes claims 1-32. Claims 12-18, 21, and 28 are allowed. Claims 1-5, 7-11, 19, 20, 22-27, and 29-32 were rejected by the Examiner. By this amendment, claims 1, 19, and 23 have been amended.

Claims 1-5, 7-11, 19-20, 22-27, and 29-32 were rejected under 35 U.S.C. §103(a) as being unpatentable over Takahashi et al. (U.S. Patent No. 6,240,075) in view of Breuckheimer et al. (U.S. Patent No. 6,496,508).

Claim 6 was rejected under 35 U.S.C. §103(a) as being unpatentable over Takahashi and Breuckheimer in view of Wright et al. (U.S. Patent No. 6,366,776).

The rejection of claims 1-5, 7-11, 19-20, 22-27, and 29-32 under 35 U.S.C. §103(a) as being anticipated by Takahashi in view of Breuckheimer is respectfully traversed. As previously described, Takahashi presents a satellite communication system that switches data cells between input and output nodes according to an arbitration scheme (col. 1, lines 30-62). Takahashi receives ATM cells that do not contain assigned virtual path identifiers, or VPIs (col. 2, lines 16-28, lines 58-65). A processor (item 54 in Figure 1) in a processing module (item 50 in Figure 1) on the satellite determines if the ATM data cell, which does not contain an assigned VPI, requires multicast processing (col. 2, lines 28-46). The processor then adds a routing code to each ATM data cell from a look up table memory (item 56 in Figure 1) that corresponds to a multicast or outbound processing module on the satellite (col. 2, lines 47-58). Thus, the system of Takahashi

includes a lookup table of routing codes and a processor to assign output routing codes to input data cells, which do not contain VPIs (col. 2, lines 447-65). Only *after the ATM data cells have been routed to an output module* via the lookup table without the use of VPIs may VPIs and virtual channel path identifiers (VCIs) be added by the processor to the ATM data cells (col. 2, lines 58-65). As stated by the Examiner, Takahashi does not teach examining an assigned VPI in a data cell.

Breuckheimer relates to coupling a narrowband network to a broadband network (Abstract; col. 1, lines 18-23; col. 4, lines 22-25). Brueckheimer preferably uses phone lines, trunks and exchanges to communicate between users, as illustrated in Figure 4, for example. Brueckheimer connects communication traffic on a trunk circuit in the synchronous domain to a packetized data environment in an asynchronous domain (col. 1, lines 23-27). Brueckheimer does not discuss a satellite network. Brueckheimer does not relate to virtual path switching of a data cell on a satellite. Brueckheimer does not assign a VPI for routing of an ATM data cell prior to uplink of the data cell to a satellite.

While Brueckheimer mentions pre-provisioning connection paths, the connection paths are internal or inter-node connections in the interface between the narrowband network and broadband network (col. 4, lines 22-51). The VPI/VCI information assigned to a data cell is also separate from connection identifiers in Brueckheimer (col. 4, lines 30-45). Data in Brueckheimer is converted and transmitted from a synchronous network to a packetized ATM network (Abstract; col. 4, lines 22-37). Therefore, VPI/VCI information is only assigned after the connection information has been transmitted across

the interface, and data has been converted to ATM data packets (col. 1, lines 18-27; col. 7, lines 19-30;).

Brueckheimer includes a call server coupled to a connection broker communicating with a switching fabric to transmit between a narrowband network and an ATM network (col. 7, lines 19-33). The connection broker controls signals that are sent between narrowband networks via the broadband network (col. 7, lines 64-67 and col. 8, lines 1-4). The resolution intelligence processor 68 in the connection broker 44 determines routing before the data is converted to ATM format for relay (See Figure 3; col. 9, lines 1-45). A network adapter maps narrowband trunks to virtual channels (with VPI/VCI, for example) after routing has been determined (Figure 5; col. 15, lines 63-67; col. 16, lines 1-67).

Conversely, the invention of Applicant teaches virtual path switching of a data cell on a satellite based on an assigned VPI. Unlike Takahashi and Brueckheimer, in which a VPI may be assigned to an ATM data cell only after the routing of the ATM data cell to the output has been determined, the invention of Applicant teaches an uplink with data cells already containing assigned VPIs used to determine data cell routing in the satellite for output transmission from the satellite. The transmission destination path of a data cell at the satellite is determined based on the data cell's assigned VPI. As recited in claim 1, a data cell is received at a satellite input port. Then, the VPI of the received data cell is examined to determine the output port with which the data cell is associated. Finally, the data cell is transferred to the output port of the satellite based on the VPI. In

claim 19, the data cell is received at a satellite input port. The VPI of the data cell is examined to determine the destination output port of the data cell based on the VPI, and a routing tag is attached to the data cell identifying a next virtual channel link. Then, the data cell is transferred to the destination output port based on the VPI. In claim 23, circuitry in the satellite path switching apparatus responds to address bits in a data cell and to an assignment of the address bits to the output ports based on an assigned virtual path identifier (VPI) in the data cell to couple the data cell to at least one output port.

Takahashi relates to routing in a satellite network based on arbitration without VPI and assigns VPI after routing has been determined. Breuckheimer relates to interfacing between a narrowband network and a broadband network in a terrestrial telephone trunk system. Therefore, there is no suggestion to combine the teachings of Takahashi with the teachings of Breuckheimer. However, assuming for the sake of argument that Takahashi and Breukheimer may be combined, the combination still would not teach or suggest the elements of the claimed invention. Breuckheimer also does not assign VPI until after routing has been determined by the connection broker and call server. The hypothetical system of Breuckheimer and Takahashi would interface between a narrowband network to an ATM network including a satellite system. Once an ATM data cell was uploaded to a satellite, an arbitration scheme on the satellite would determine cell routing independent of VPI. Consequently, neither Takahashi nor Breuckheimer, taken alone or together, teaches or suggests assign a VPI routing for routing prior to uplink of the data cell to the satellite. Additionally, neither Takahashi nor

Breuckheimer uses the same assigned VPI for an entire virtual connection. Furthermore, Takahashi and Brueckheimer do not teach or suggest associating a VPI with each satellite output port.

The Applicant now turns to the rejection of claim 6 under 35 U.S.C. §103(a) as being unpatentable over Takahashi and Brueckheimer in view of Wright. Since claim 6 depends from claim 1, Applicant respectfully submits that claim 6 is allowable, as discussed above. However, Applicant will proceed to discuss the rejection of claim 6. As previously discussed, Wright teaches end-to-end transmission techniques for a processing satellite system. Wright does not discuss routing of data cells between input and output ports in the satellite. Wright also does not discuss the use of VPIs in data cells for routing.

In Wright, data cells are transmitted to a communications satellite via an uplink (col. 1, lines 40-42, Fig. 1). The data cells are grouped and encoded with an error correction code prior to transmission via an uplink (col. 1, lines 46-48). The encoded data cells are modulated into uplink channels for transmission to a satellite (col. 1, lines 50-56). Once the modulated, encoded uplink channels arrive at the satellite, the channels are demodulated and the error correction codes decoded without regard to a particular routing scheme or use of VPIs (col. 1, lines 58-61). Errors in the error correction codes from the uplinked data cells are detected and the satellite decoder makes an error estimate (col. 1, lines 60-63). Then, report cells are generated containing the error estimate information and transmitted on a downlink beam, without regard to a VPI or particular

routing scheme, to a ground terminal (col. 1, lines 64-67, col. 2, lines 1-8). The power level of the satellite uplink is adjusted by a processor at the ground terminal in response to the error report cells to ensure transmissions reliably reach the satellite and are not distorted (col. 2, lines 4-8). Thus, Wright does not teach a scheme for routing of data cells between input and output ports in the satellite. Particularly, Wright does not teach the use of VPIs in data cells for routing to satellite outputs.

Therefore, Wright does not teach examining an assigned VPI of a data cell received at a satellite to determine a destination output port from the VPI of the data cell, as recited in claims 1, 19, and 23. Additionally, Wright does not teach examining a control subfield to determine a level of error control for the data cell routed to an output port based on an assigned VPI, as recited in claim 6. In addition, Wright does not teach transferring the data cell to a destination output port of the satellite based on the assigned VPI, as recited in claim 6. Combining Wright with Takahashi and/or Brueckheimer would not have enabled a person of ordinary skill in the art to practice claim 6 at the time of invention. The deficiencies described above with respect to the VPI would still be present as Wright does not address the use of VPI in data cell routing.

By this response, claims 1, 19, and 23 have been amended. Claims 1 and 19 have been amended to recite the limitation that the data cell that is received at an input port of a satellite includes an assigned virtual path identifier (VPI) associated with a destination output port of the satellite. Conversely, the prior art that assigns a VPI assigns the VPI after the cell has arrived at the satellite. The prior art approach requires additional

hardware and complexity at the satellite. Claim 19 also recites the limitation that the assigned VPI is unchanged for each virtual channel link in a virtual connection. This limitation is also not taught or suggested by the prior art. Rather, VPIs are assigned at different points during a transmission. Claim 23 has also been amended to recite the limitation that each of a plurality of output ports associated with a VPI. Furthermore, claim 23 recites that additional limitation that the VPI assigned to the data cell is used to route the data cell to at least one of the output ports. As described above, these limitations are not taught or suggested by the prior art. Therefore, the claims of the present invention should be allowable.

Accordingly, the application as amended is believed to be in condition for allowance and an action to this effect is respectfully requested.

If the Examiner has any questions or the Applicant can be of any assistance, the Examiner is invited and encouraged to contact the Applicant at the number below.

The Commissioner is authorized to charge any necessary fees or credit any overpayment to the Deposit Account of McAndrews, Held & Malloy, Account No. 13-0017.

Respectfully submitted,

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